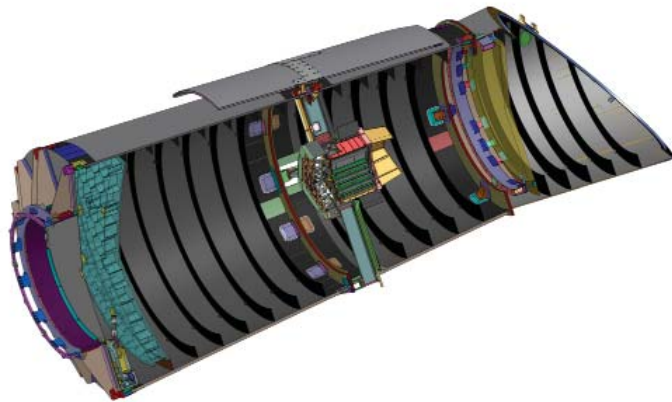




## technology opportunity

# Photometer

## Track the Path of a Moving Light Source



The photometer uses a combination of unique optics and a detector array to eliminate moving parts inherent in a tracking sunphotometer.

A photometer that tracks a path of a moving light source with little or no motion of the photometer components. The system includes a non-moving, truncated paraboloid of revolution, having a paraboloid axis, a small entrance aperture, a larger exit aperture and a light-reflecting inner surface that receives and reflects light in a direction substantially parallel to the paraboloid axis. The system also includes a light processing filter to receive and process the redirected light, and to issue the processed, redirected light as processed light, and an array of light receiving elements, at least one of which receives and measures an associated intensity of a portion of the processed light. The system tracks a light source moving along a path and produces a corresponding curvilinear image of the light source path on the array of light receiving elements. Undesired light wavelengths from the light source may be removed by coating a selected portion of the reflecting inner surface or another light receiving surface with a coating that absorbs incident light in the undesired wavelength range.

### Benefits

- Uses a combination of unique optics and a detector array to eliminate moving parts
- Instrument is smaller, more compact, more reliable, and more versatile
- Consumes little electrical power, other than what is required by light sensors and processing circuits

### Applications

- Aircrafts
- Weather stations
- Pollution monitoring
- Environmental monitoring
- Photobiology

## Technology Background

The interaction between the sun's energy and particulates in the atmosphere is recognized as one of the biggest driving forces for climate. Sunphotometers are commonly used on the Earth's surface, as well as on aircraft, to determine the solarenergy attenuated by aerosol particles in the atmosphere. A suitably modified sunphotometer might be used to study the dynamics of an environment on another planet, satellite or other moving body, as well as on the Earth itself.

The information provided by such an instrument is used to determine the spatial and temporal distribution of aerosols in the atmosphere, their distribution of sizes, and column densities of some gas phase constituents. Typically, this instrument tracks the sun or other major light sources to measure the direct solar attenuation and other relevant parameters. What is needed is an instrument that provides this information, has no moving parts, consumes little electrical power, other than what is required by light sensors and processing circuits to characterize the light received, and that is relatively small and lightweight, preferably with a mass no larger than about several kgm. Such an instrument would be ideal for studying an atmosphere of a planet.

## Patents

This technology has been patented (U.S. Patent 7,531,775).

## Licensing and Partnering Opportunities

This technology is part of NASA's Innovative Partnerships Program, which seeks to transfer technology into and out of NASA to benefit the space program and U.S. industry. NASA invites companies to inquire about the licensing possibilities for Photometer for Tracking a Moving Light Source for commercial applications.

### For More Information

**If you would like more information about this technology, please contact:**

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